

What is claimed:

1. A method for rendering anatomical information of a body from tomographic data comprising the steps of:

5 receiving said tomographic data obtained from a digital imaging apparatus wherein said tomographic data is displayable in a first portion of a display as one or more two-dimensional tomographic sections of a sequence of two-dimensional tomographic sections;

10 determining a third dimension from the sequence of two-dimensional tomographic sections to create a first volumetric view wherein said first volumetric view is displayable in a second portion of the display;

determining a second volumetric view of a selected feature shown in the first or second portion wherein said second volumetric view is displayable in a third portion of the display; and

15 rendering one or more of said first, second or third portions of the display.

2. The method of claim 1 further including the step of providing on-off toggle whereby any of the display portions can be toggled on to display anatomical information or toggled off to remove from display the corresponding display portion.

3. The method of claim 2 further including the step of providing a scroll bar whenever the first display is toggled on, for selecting the particular two-dimensional tomographic section to be displayed in the first display portion.

25 4. The method of claim 1 wherein the step of rendering further includes providing display markers indicative of a region of interest in the body.

30 5. The method of claim 1 wherein the step of rendering further includes providing display markers indicative of a potentially cancerous nodule in the body.

6. The method of claim 1 wherein anatomical information is rendered in the first and second portion of the display.

7. The method of claim 6 further comprising the step of updating the anatomical information in the second display portion in response to a region of interest or an image rendered in the first portion of the display.

8. The method of claim 6 further comprising the step of updating the anatomical information in the first display portion in response to an image rendered in the second portion of the display.

9. The method of claim 1 wherein anatomical information occurs in the first and third portions of the display.

10. The method of claim 9 further comprising the step of updating the anatomical information in the first display portion in response to a region of interest or an image rendered in the third portion of the display.

11. The method of claim 9 further comprising the step of updating the anatomical information in the third display portion in response to an image rendered in the first portion of the display.

12. The method of claim 1 wherein anatomical information occurs in the second and third portions of the display.

13. The method of claim 12 further comprising the step of updating the anatomical information in the second display portion in response to a region of interest or an image rendered in the third portion of the display.

14. The method of claim 12 further comprising the step of updating the anatomical information in the third display portion in response to a region of interest or an image rendered in the second portion of the display.

15. The method of claim 1 wherein anatomical information occurs in the first, second and third portions of the display.

16. The method of claim 15 further comprising the step of updating the anatomical information in a display portion in response to the region of interest or the image rendered in a different portion of the display.

5 17. The method of claim 15 further including the step of providing a scroll bar for selecting the particular two-dimensional tomographic section to be displayed in the first display portion.

10 18. A system for rendering anatomical information of a body from tomographic data obtained from a digital imaging apparatus comprising:

a first portion of a display for rendering a sequence of two-dimensional tomographic sections obtained from said tomographic data;

15 a second portion of the display for rendering a first volumetric view of the body wherein said first volumetric view includes a third dimension acquired from the sequence of two-dimensional tomographic sections; and

a third portion of the display for rendering a second volumetric view of a selected feature shown in the section then being rendered on the first portion or second portion of the display.

20 19. The graphical user interface of claim 18 further comprising a fourth portion of the display for indicating the relative position of axial sections containing features of interest, said scroll buttons enabling a user to increment all displays (axial and volumetric) from one section to another.

25 20. The system of claim 18 wherein the view of the third portion is rotatable by input from a trackball or cursor.

30 21. The system of claim 18 wherein the particular section being rendered at any time in the first portion is selectable by means of a scroll bar or scroll buttons.

22. The system of claim 18 wherein the first portion of the display includes at least one first display marker indicative of a region of interest in the body.

23. The system of claim 22 wherein at least one second display marker is displayed in the second portion of the display at a location in the second portion of the display corresponding to the same location in the body as at least one first display marker.

5 24. The system of claim 22 wherein the region of interest includes a potentially cancerous nodule.

25. The system of claim 18 wherein said second portion includes an indication on said volumetric view of the position of the section then being rendered on the first  
10 portion of the display.

26. The system of claim 18 wherein said volumetric view of the third portion of the display is selectively rotatable so as to render information in the least one tomographic section adjacent to the section then being rendered on the first portion of the display.  
15

27. The system of claim 18 wherein the first portion of the display includes at least one first display marker and wherein the second portion of the display includes at least one second display marker, said first display marker and said second display marker corresponding to the same location in the body.  
20

28. The system of claim 27 wherein a first display marker is highlighted.

29. The system of claim 28 wherein a second display marker is highlighted corresponding to the same location in the body as identified by the highlighted first display  
25 marker.

30. The system of claim 27 wherein the first display marker is responsive to the second display marker.

31. The system of claim 27 wherein the second display marker is responsive to the first display marker.  
30

32. The system of claim 27 wherein the third portion of the display includes a third display marker corresponding to the same location in the body as highlighted by the  
35 first display marker or the second display marker.

33. The system of claim 32 wherein the third display marker is responsive to the first display marker or second display marker.

34. The system of claim 18 wherein the first portion of the display includes at least one first display marker and wherein the second portion of the display includes one second display marker and wherein the third portion of the display includes one third display marker, said at least one first display marker defining a first region of interest, said at least second display marker defining a second region of interest and said at least third display marker defining a third region of interest wherein said first region of interest, said second region of interest and said third region of interest correspond to the same location of the body.

35. The system of claim 34 wherein said first region of interest, said second region of interest and said third region of interest include a first nodule, second nodule and third nodule, respectively.

36. The system of claim 35 wherein the first nodule, second nodule and third nodule correspond to a nodule in the body.

37. The system of claim 36 wherein the nodule is potentially cancerous.

38. The system of claim 18 wherein the interface displays a slice number identifying a CT axial scan.

39. The system of claim 18 further including a fourth portion of the display, said fourth portion displaying patient information.

40. The system of claim 18 further including a fourth portion of the display, said fourth portion when activated displaying a magnification box for displaying an enlarged view of a selected region.

41. The system of claim 40 wherein the magnification box is configurable.

42. The system of claim 40 wherein the magnification box has a center corresponding to a location defined by a marker.

43. The system of claim 40 wherein the magnification box is displayed within the first portion of the display.

5 44. The system of claim 18 wherein the first portion of a display renders an image formed from a composite of more than one tomographic axial section.

45. The system of claim 18 further including a fourth portion of the display, said fourth portion when activated displaying thick slices.

10 46. The system of claim 18 further including a fourth portion of the display, said fourth portion when activated displaying markers in said first portion, said second portion and said third portion of the display.

15 47. The system of claim 18 further including a fourth portion of the display, said fourth portion when activated removing from display any markers in said first portion, said second portion and said third portion of the display.

20 48. The system of claim 18 further including a navigation tool.

49. The system of claim 48 wherein the navigation tool includes identifiers graphically corresponding to at least one tomographic axial section displaying a nodule when said tomographic axial section is rendered in the first portion.

25 50. The system of claim 48 wherein the navigation tool includes an identifier graphically corresponding the relative location of the tomographic axial section then being rendered in the first display within the sequence of tomographic axial section.

30 51. The system of claim 48 wherein the navigation tool includes means for rendering a sequence of tomographic axial sections.

52. The system of claim 51 wherein the views rendered in the second portion of the display are responsive to the particular tomographic axial section then rendered in the first portion.

53. The system of claim 49 wherein the navigation tool includes means for rendering the tomographic axial section adjacent to the section then being rendered in the first portion of the display.

5 54. The system of claim 48 wherein an identifier on the navigator tool when selected displays the tomographic axial section in the first display corresponding to said identifier.

10 55. The system of claim 18 further including a fourth portion of the display, said fourth portion when activated allowing a cursor to be positioned at a first location in the first display and dragged to a second location, the distance between the first location and second location being displayed on the interface.

15 56. The system of claim 40 wherein the enlarged view includes a nodule in the tomographic axial section highlighted by an outline defining the shape of the nodule.

20 57. The system of claim 40 wherein a cursor may be positioned at a first location within the enlarged view and dragged to a second location, the distance between the first location and second location being displayed on the interface.

58. The system of claim 18 further including a fourth portion of the display, said fourth portion when activated displaying a report relating to images displayed in the interface.

25 59. The system of claim 58 wherein the report includes reference coordinates corresponding to the relative location of the one or more nodules.

60. The system of claim 58 wherein the report includes the radius of at least one nodule.

30 61. The system of claim 58 wherein the report includes the calculated volume of at least one nodule.

35 62. The system of claim 58 wherein the report includes the relative intensity of at least one nodule.

63. The system of claim 58 wherein the report includes the percentage change in volume of the size of at least one nodule over a period of time.

64. The system of claim 58 wherein the report includes the percentage change in  
5 radius of at least one nodule over a period of time.

65. The system of claim 18 further including a fourth portion of the display, said fourth portion when activated displaying a histogram of intensity levels within a selected region.  
10

66. The system of claim 18 further including a fourth portion of a display for rendering a sequence of tomographic axial sections taken of the body, a fifth portion of the display for rendering a volumetric view of the body and corresponding to the images displayed in the fourth portion and a sixth portion of the display for rendering a volumetric  
15 view of a selected feature shown in the section then being rendered on the fourth portion of the display.

67. The system of claim 66 further including a first navigation tool associable with the first portion, second portion and third portion and a second navigation tool  
20 associable with the fourth portion, fifth portion and sixth portion.

68. The system of claim 67 wherein the first navigation tool includes means for rendering a sequence of tomographic axial sections renderable in the first display.

69. The system of claim 68 wherein the second navigation tool includes means  
25 for rendering a sequence of tomographic axial sections renderable in the fourth display.

70. The system of claim 67 further including a third navigation tool wherein said third navigation tool includes means for rendering a sequence of tomographic axial sections  
30 renderable in the first display simultaneously with the rendering of a sequence of tomographic axial sections renderable in the fourth display.

71. The system of claim 18 further including a fourth portion of the display, said fourth portion when activated displaying a schedule box for scheduling processing of image  
35 data.



72. The system of claim 66 further including a navigation tool wherein said navigation tool includes means for rendering a sequence of tomographic axial sections renderable in the first display simultaneously with rendering of a sequence of tomographic axial sections renderable in the fourth display.

5

73. A method for rendering anatomical information obtained by tomographic scanning of a body comprising:

rendering on a first portion of display a sequence of axial sections, the particular section being rendered at any time being selectable by means of a scroll bar or scroll buttons;

10

rendering on a second portion of the display a volumetric view of the body, said view including an indication of the position on the body of the section then being rendered on the first portion of the display; and

rendering on a third portion of the display a view of a selected feature shown in the section then being rendered on the first portion, said view being selectively rotatable about multiple axes.

15

20

25

30

35